



Seasonal variations of prescriptions for the major syndrome types and manifestations of upper respiratory tract infection in tradition Chinese medicine



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ABSTRACT

Objective: The aim of this study is to investigate the seasonal variations of prescriptions for the three most common syndrome types and the three major manifestations of upper respiratory infections (URIs) according to the theories of traditional Chinese medicine (TCM).

Design: This is a cross-sectional study. We examined a random sample comprising 1,000,000 beneficiaries from the National Health Insurance program in 2005. Primary diagnoses including International Classification of Diseases, Ninth Revision, Clinical Modification Codes 460–465 and 487 were regarded as URIs, for which 160,357 prescriptions of Chinese herbal medicine were analyzed.

Main outcome measures: We estimated the adjusted odds ratios (ORs) of three categories of Chinese herbal formulae (CHF) used to treat the three most common types of URIs and another CHF used to alleviate manifestations of URIs throughout the four seasons.

Results: The OR for pungent–cool CHF used to relieve external syndromes was highest in the summer (OR = 1.07). The OR for pungent–warm CHF used to relieve external syndromes was highest in the winter (OR = 1.14). The OR for CHF used to alleviate cough and reduce sputum production was highest in the spring (OR = 1.00). The OR for CHF used to alleviate nasal discharge and congestion was highest in the winter (OR = 1.19).

Conclusion: There are seasonal variations of prescriptions for the major syndrome types and manifestations of URIs in TCM. The results of this study may serve as a reference for TCM physicians in medical preparation and clinical practice.

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1. Introduction

Several diseases are affected by the weather and associated with seasonality.¹ Acute respiratory tract infections are the most common human diseases worldwide.^{2,3} Complications of respiratory tract infections are major causes of morbidity and mortality in young children, older people, and other high-risk groups.⁴ Upper respiratory tract infections (URIs), which include nasopharyngitis (also known as the common cold), rhinosinusitis, otitis media,

pharyngitis, bronchitis, and nonspecific URIs.⁵ In this study, we investigated the seasonal variations of Chinese herbal formulae (CHF) for the three most common syndrome types and the three major manifestations of URI by exploring the prescriptions of Chinese herbal medicines (CHMs) for URIs on the basis of traditional Chinese medicine (TCM).

TCM has been used by Chinese people for more than 2000 years. TCM treatment modes include CHMs, acupuncture and moxibustion, and traumatology and orthopedics, which include manual therapy and plaster application.⁶ TCM theories differ from those of Western medicine (WM). TCM physicians prescribe complex herbal prescriptions, which include one or several formulae and herbs, for diseases or syndromes according to the related TCM theories.⁷ The efficacy of a single herb is typically lower than that of a formula.⁸

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Formulae in prescriptions target the major manifestations of a disease, whereas herbs in the prescription enable the functions of the formulae.

According to TCM theories, the three most common syndrome types of URIs are wind-cold URI, wind-heat URI, and summer-heat and dampness URI. Of these three syndrome types of URIs, wind-heat URI affects humans most frequently.^{9–11} The symptoms of a wind-cold URI include aversion to cold, severe chill, mild fever, lack of sweat, headaches, sore limbs, nasal congestion, thin nasal discharge, cough with clear and thin sputum, and lack of thirst or thirst with a preference for hot drinks. Relieving external syndrome with pungent-warm CHMs is the treatment principle for wind-cold URI. The symptoms of a wind-heat URI include severe fever, dryness of mouth and pharynx, thirst, aversion to wind, distended headaches, sore throat, sticky nasal discharge, and cough with sticky sputum. Relieving external syndrome with pungent-cool CHMs is the treatment principle for wind-heat URI. The symptoms of a summer-heat and dampness URI include fever, slight aversion to wind, little sweating or sweating without fever relief, dizziness, a heavy or distending sensation in the head, heavy or sore limbs, sticky nasal discharge, cough with sticky sputum, restlessness, oppressive sensation in the chest, and diarrhea. Relieving exterior syndrome with clearing away summer-heat and resolving dampness is the treatment principle for summer-heat and dampness URI.^{9,10}

The differential diagnosis between wind-cold URI and wind-heat URI must be accurate to ensure appropriate treatment. If pungent-cool CHF used to relieve external syndromes are misprescribed to treat wind-cold URIs, they might prevent normal sweating, exacerbate the patient's condition, and cause complications. If pungent-warm CHF used to relieve external syndromes are misprescribed to treat wind-heat URIs, they might increase heat, reduce bodily fluids and blood, and cause the disease to transform and develop.⁹ Therefore, the diagnoses of and prescriptions for URIs must be accurate to prevent potentially exacerbating the patient's health condition.

Pungent-warm CHF used to relieve external syndromes, such as Jing-Fang-Bai-Du-San and Gui-Zhi-Tang, are used to treat wind-cold URIs. Pungent-cool CHF used to relieve external syndromes, such as Yin-Qiao-San and San-Giu-Yin, are used to treat wind-warm URIs. CHF used to eliminate summer-heat and dampness URI include Huo-Xiang-Zheng-Qi-San and Qiang-Hou-Sheng-Shi-Tang.^{8,11,12} Appendix A (in Supplementary material) lists the three categories of CHF that are available under Taiwan's National Health Insurance (NHI) program and used to treat the three most common syndrome types of URIs.^{8,10,12,13}

The symptoms associated with URIs are diverse.^{9,10,14–18} CHMs are prescribed according to the diverse manifestations of URIs.¹⁹ In this study, we investigated the seasonal variations of the three most common categories of URI symptoms, including cough with sputum, nasal discharge and congestion, and headaches and dizziness, by analyzing the prescription frequency of CHF prescribed to treat these three categories of symptoms. CHF such as Er-Ke-Xing-Su-San, Xing-Su-San, Ning-Sou-Wan, and Zhi-Sou-San are used to alleviate cough and reduce sputum production; Xin-Yi-Qing-Fei-Tang and Cang-Er-Zi-San are used to alleviate nasal discharge and congestion; and Chuan-Xiong-Cha-Tiao-San is used to relieve headaches and dizziness.^{8,10,12,13}

The objective of this study was to explore the seasonality of CHF for the three most common syndrome types of URIs and the three categories of the most common URI symptoms on the basis of TCM theories. We evaluated the prescription frequencies of different categories of CHF prescribed for URIs throughout the four seasons by analyzing claims data from the National Health Insurance Research Database (NHIRD). The results of this study not only provide a reference for TCM physicians in medical preparation and the treatment of URIs but also verified the TCM theories related to

the seasonal variations of prescriptions for the three most common syndrome types of URIs.

2. Methods

2.1. Data sources and study samples

The data sets used in this study were obtained from the NHIRD which included the datum of enrollees and medical providers under NHI program.^{20,21} TCM covered by the NHI program includes CHMs, acupuncture, and traumatology therapy.^{22,23} The CHMs prescribed through the NHI program are extracted powder preparations.²⁴ Enrollees who visit ambulatory clinics contracted with the National Health Insurance Administration (NHIA) receive free treatment or pay minimal fees or copayments.^{22,23} Random sampling was used to select 1,000,000 beneficiaries from the enrollees under the NHI program in 2005. The selected 1,000,000 beneficiaries visited medical facilities 160,397 times for seeking TCM treatment for URIs from March 2005 to February 2006 and received 160,357 prescriptions, which we analyzed.

2.2. Inclusion and exclusion criteria

The URIs investigated in this study included acute nasopharyngitis (International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] Code 460.XX), acute sinusitis (ICD-9-CM Code 461.XX), acute pharyngitis (ICD-9-CM Code 462.XX), acute tonsillitis (ICD-9-CM Code 463.XX), acute laryngitis and tracheitis (ICD-9-CM Code 464.XX), acute URI of multiple unspecified sites (ICD-9-CM Code 465.XX), and influenza (ICD-9-CM Code 487.XX); these were the primary diagnostic codes in the medical records of ambulatory visits.^{5,25} Although the NHI program covers both ambulatory and inpatient care for WM, only ambulatory visits are covered for TCM; therefore, we included only TCM ambulatory visits in our analyses. Our findings were not affected by the limitation of excluding TCM inpatient care in the NHI program because patients are unlikely to require inpatient care for treating URIs. If a URI developed into another disease, such as pneumonia, the ICD-9-CM diagnostic code would indicate a disease other than a URI, and therefore would not be included in our analyses.

2.3. Ethical considerations

This research was approved by the Institutional Review Board (IRB) of Taipei City Hospital, Taipei City Government, Taiwan (TCHIRB-990502-E). The identification numbers of the selected beneficiaries and the names of the medical facilities in this study were replaced by unique random numbers to protect confidentiality.

2.4. Study variables

Spring was defined as March–May 2005, summer as June–August 2005, autumn as September–November 2005, and winter as December 2005–February 2006. The independent variables were sex, age, and urbanization level. Age was categorized into four groups: 0–19, 20–39, 40–59, and ≥60 years. Urbanization level was divided into high urbanization, medium urbanization, and low urbanization, a classification that originated from a study by Liu, who divided Taiwan into seven urbanization levels ranging from highly urbanized towns to remote villages.²⁶ Thus, we regarded the first to third levels as high urbanization; the fourth and fifth levels as medium urbanization; and the sixth and seventh levels as low urbanization.^{26,27} Prescription frequency was calculated according to the number of the prescriptions, that is, one category of CHF divided by the number of total prescriptions in

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